

Docket No. 2003-085-TAP

**CLAIMS:**

What is claimed is:

- 1 1. A storage medium load and unload apparatus for  
2 diverting a storage medium insertion impact force,  
3 comprising:  
4 a shuttle having a first pin with a first radius  
5 extending from a side surface of the shuttle and a  
6 protrusion having a posterior edge extending from the  
7 side surface, wherein the posterior edge is displaced a  
8 first distance from a center of the first pin; and  
9 a fixed side plate having a flange with a vertical  
10 edge and a first slot with which the first pin is engaged  
11 has an anterior edge and a curved posterior edge with a  
12 first width between the anterior edge and the curved  
13 posterior edge, wherein the vertical edge of the flange  
14 is displaced a second distance from the anterior edge of  
15 the first slot,  
16 wherein a sum of the first width and the second  
17 distance is greater than the sum of the first distance  
18 and the first radius.
- 1 2. The apparatus of claim 1, wherein the first slot has  
2 a vertical posterior edge conjoined with the curved edge  
3 and displaced vertically below the curved posterior edge,  
4 wherein a second width of the first slot at the vertical  
5 posterior edge is less than the first width.

Docket No. 2003-085-TAP

1 3. The apparatus of claim 1, wherein the protrusion is  
2 constrained to vertical displacements when in abutment  
3 with the vertical edge of the flange.

1 4. The apparatus of claim 1, wherein the shuttle  
2 comprises a second pin having a second radius extending  
3 from the side surface, the second pin displaced by a  
4 third distance from the protrusion posterior edge, and  
5 the fixed plate comprises a second slot having an  
6 anterior edge and a curved posterior edge with the first  
7 width separating the anterior edge and the curved  
8 posterior edge of the second slot,  
9 wherein the second pin is engaged with the second  
10 slot and a sum of the first width and the second distance  
11 is greater than a sum of the third distance and the  
12 second radius.

1 5. The apparatus of claim 1, further comprising:  
2 a moveable side plate having a partially ramped slot with  
3 a horizontal slot portion and a ramped slot portion,  
4 wherein the first pin is engaged with the partially  
5 ramped slot.

1 6. The apparatus of claim 5, wherein the moveable side  
2 plate comprises a horizontal slot, and the shuttle  
3 comprises a second pin extending from the side surface,  
4 wherein the second pin is engaged with the  
5 horizontal slot.

Docket No. 2003-085-TAP

1 7. The apparatus of claim 1, further comprising:  
2 a cam having a spiral slot extending from a first radius  
3 of the cam to a second radius of the cam, wherein the pin  
4 is engaged with the spiral slot.

1 8. The apparatus of claim 7, wherein the shuttle is  
2 displaceable from an unloaded position to a loaded  
3 position, wherein an outer end of the spiral slot is  
4 positioned outside the first slot when the shuttle is  
5 positioned in the unloaded position.

1 9. The apparatus of claim 1, wherein the first slot  
2 comprises a second curved surface with the first width  
3 between the second curved surface and the anterior edge,  
4 and the shuttle comprises a second pin extending from the  
5 side surface,  
6 wherein the second pin is engaged with the first  
7 slot.

1 10. The apparatus of claim 9, wherein a maximum width  
2 between the anterior edge and the first curved surface is  
3 vertically displaced by a third distance from a maximum  
4 width between the anterior edge and the second curved  
5 surface.

1 11. The apparatus of claim 10, wherein the first pin and  
2 the second pin are vertically displaced by the third  
3 distance.

Docket No. 2003-085-TAP

1 12. The apparatus of claim 1, wherein a width of the  
2 first slot tapers from the first width to a second width  
3 less than the first width.

1 13. The apparatus of claim 12, wherein the second width  
2 is located vertically below the first width.

1 14. The apparatus of claim 1, wherein the first pin is  
2 rectilinearly displaceable within the first slot.

1 15. A load and unload apparatus for diverting an impact  
2 force applied to the load and unload apparatus,  
3 comprising:  
4 a shuttle having a cavity configured to accept a  
5 storage medium;  
6 an elevator mechanism for reciprocally elevating and  
7 lowering the shuttle; and  
8 an impact diversion mechanism for diverting an  
9 impact force resulting from insertion of the storage  
10 medium into the cavity in the shuttle,  
11 wherein the impact diversion mechanism diverts the  
12 impact force to a side surface of the shuttle.

1 16. The load and unload apparatus of claim 15, wherein  
2 the impact diversion mechanism comprises a protrusion  
3 extending from the side surface and a flange located  
4 within the apparatus.

Docket No. 2003-085-TAP

1 17. The load and unload apparatus of claim 15, wherein  
2 the impact diversion mechanism comprises a flange located  
3 on a fixed side plate of the apparatus.

1 18. The load and unload apparatus of claim 17, wherein  
2 the impact diversion mechanism further comprises a  
3 protrusion extending from the side surface of the shuttle  
4 that is brought into abutment with the flange on  
5 application of the impact force to the shuttle.

1 19. The load and unload apparatus of claim 15, further  
2 comprising:  
3 a pin extending from the side surface; and  
4 a slot having a tapered width, wherein  
5 the pin is engaged with the slot at a first position  
6 in the slot having a first width when the shuttle is  
7 located in an unloaded position for reception of the  
8 storage medium.

1 20. The load and unload apparatus of claim 19, wherein  
2 the shuttle is reciprocally displaceable from the  
3 unloaded position to a loaded position,  
4 wherein the pin is engaged with the slot at a second  
5 position in the slot having a second width when the  
6 shuttle is located in the loaded position, the first  
7 width greater than the second width.